WINTER BIRD CENSUS IN A SOUTH FLORIDA HAMMOCK AND SLOUGH

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A number of the ornithologists who have visited south Florida have published lists of the birds which they were able to collect or see. Such an annotated list of the birds of Paradise Key and Taylor Slough was published by A. H. Howell (1921). Paradise Key is but one of a band of islands or keys mostly forested by Miami Rockland Pine (Davis, 1943, vegetation map) which extends southwesterly from Miami into the heart of Everglades National Park. These keys rise two or three feet above the sawgrass marshes to the southwest. Fingers of sawgrass glades, which reach southeastwardly through from the Everglades to the coastal marshes, separate the pinelands into islands which are known collectively as the Everglades Keys.

In the past Paradise Key has differed markedly from the other Everglades Keys. Instead of sunny, open pineland, it was characterized by a dense jungle of immense live oaks whose great limbs were clustered with tons of epiphytic orchids, ferns, and tillandsias, and strung with many kind of vines and lianas. Lofty royal palms towered up through this hammock. Small (1917) has described its many tropical botanical features in detail, and Safford (1919, p. 378) points out that this interesting crescendo of tropical hammock growth was originally attained because fire was kept from it by the especially deep finger glades which protected it on either side. The one to the east, Taylor Slough, is so deep that before the drainage of the Everglades it was thought never to go dry.

Probably drainage of the Everglades, begun at New River in 1906, contributed to excessive dryness which permitted fire to raze the north end of Paradise Key in 1929 and to destroy four-fifths of the remaining hammock in 1945. Two years after this latter fire, Paradise Key was a part of the great wilderness which was accepted by the National Park Service for protection as Everglades National Park. A token remnant of the great old hammock trees exists today, little disturbed by the fires mentioned and protected from further threat by fire-fighting crews of park rangers. Over the

remainder of the area formerly occupied by the hammock an almost impenetrable scrub growth of young hammock trees has sprung up.

Small (1916) has told how Kirk Monroe was probably the first white man to visit Paradise Key (1882) and has chronicled the early visits of naturalists to the area. Safford *(loc. cit.)* mentions that Paradise Key and some of the surrounding glades and nearby pinelands were set aside in 1915 as Royal Palm State Park, and the hammock has often been called Royal Palm Hammock. The presence of a Royal Palm Hammock at Collier-Seminole State Park in nearby Collier County, Florida, however, offers such potentialities for confusion that for the area under discussion it seems better to adhere to the older name of Paradise Key.

The glade which bounds Paradise Key on the east differs from most of the finger glades. In addition to the ordinary expanse of sawgrass *(Mariscus jamaicensus),* usually somewhat dwarfed where the mantle of soil is thin over the bedrock, this finger glade contains a feature known as Taylor Slough. During the summer and fall this slough constitutes a broad, sluggish water course. As the dry seasons of winter and spring progress, however, flow ceases, and water levels gradually disappear below the surface of the glade everywhere except in the deep pools of the slough. Aquatic animal life during this drying up period gradually funnels into less and less space. As this takes place, alligators, otters, and wading birds gather about the residual pools and feed upon the concentrating fishlife. Taylor Slough differs vegetatively from the rest of the glade it occupies. In the part of Taylor Slough with which this paper is concerned, willows flank the deeper ponds of the slough on either side for 100 feet or more, and patches of tall, dense sawgrass occur. There are also patches of tall cane *(Phragmites phragmites),* areas of nearly pure buttonbush *(Cephalanthus occidentalis)* and occasional pond apple trees *(Annona glabra).*

While seasonally employed by the National Park Service during the winter of 1951-52, the writer was stationed at Royal Palm Ranger Station which is situated on the eastern edge of Paradise Key by Taylor Slough. This assignment permitted a program of weekly bird censuses carried out by walking the road (Florida Route No. 27) which crosses east and west through the center of the hammock and slough, and the Anhinga Trail, an elevated boardwalk extending north into the slough 375 feet from the road. This

route includes 100 yards of mature hammock, 780 yards of scrubby second growth hammock, and 830 yards of slough. Each census was begun between 8:15 and 9:00 A.M. and lasted from 1½ to 2½ hours. While returning over parts of the route already censused, the writer recorded only new species. The twelve censuses were made on the following dates: December 11, 18, 26, January 2, 10, 17, 24, 31, February 7, 14, 21, 28. Species of birds observed were recorded for all of these censuses, but recording numbers of individuals began with the first January census. While the number of censuses on which any species was seen applies to all three months, numbers of individuals generally applies only to January and February. Exceptions to this are made in special cases such as that of the rare short-tailed hawk. In preparing this manuscript only 3 months after finishing the census, the writer has relied on his memory in regard to numbers of some such rare birds seen on December censuses. It should perhaps be mentioned that the writer was stationed here in a similar capacity during the winter and spring of 1950-51, and spent much time on bird walks both winters.

The present paper indicates the kinds and numbers of birds observed during these censuses and compares these with abundance reported by Howell *(op. cit.)*, wherever a difference appears to exist.

It is interesting to speculate on possible explanations of a few of these differences. If drainage operations in the Everglades have truly reduced winter water levels in the park area as much evidence suggests, this may explain the present lack of ducks and shore birds which were at Taylor Slough in Howell's time. His opportunities to see ground doves and perhaps mourning doves, may relate to the then dusty gravel structure of the road. It is now asphalt, and no doves were observed during my censuses. A further change which might be expected to influence the abundance of birds is the burning of much of the great hammock as already described. This may have improved the hammock area for sparrowhawks and account for the apparent increase in their abundance. Howell's winter records of Savannah sparrows "fairly common", Grasshopper Sparrows, White-throated Sparrows, and Song-sparrows are very interesting today since these birds are not only absent from my census records, but have eluded me entirely during my two

winters of bird-watching at Paradise Key. Other winter birds recorded by Howell *(op. cit.)* but not in the 1951-52 census, are either accidentals or were present in the vicinity outside of my census area.

The writer observed seven species this winter which were not reported by Howell for 1917-18-19. Two of these, the American and Snowy Egrets, demonstrate by their presence now as regular and abundant winter visitors, the success of the conservationist movement to save them from extinction. The occurrence here now of the Roseate Spoonbill may be due in large part to the rescue from destruction of the remnant Florida Bay rookery which was nurtured back to a healthy colony by organized birdwatchers clubs and particularly Robert P. Allen. If any local changes may be construed to have contributed to an apparent increase in numbers of the Short-tailed Hawk, the protection afforded it in the recently established 1,228,000-acre Everglades National Park is surely one. The Duck Hawk may be responding also to the establishment of this park; although it is by no means now regular at Paradise Key.

Rapid departure of many of the wading birds from the slough area in early February seemed to be related to heavy rains on the 2nd and 5th. This phenomenon has been noted over the years by old-timers such as park warden M. Barnie Parker and park ranger Erwin C. Winte. Their explanation for it is that steady lowering of water levels during the dry season progressively concentrates the fish and keeps them easily available to the wading birds. Then, when a heavy rain interrupts the dry season, water rises and spreads markedly in the slough permitting the fish to disperse. The wading birds then move out. We have no records of water levels for Taylor Slough during this period, but U. S. Geological Survey records are available for water levels in the Ingraham Highway canal in the Everglades 13 miles west of Taylor Slough. These are presented in Figure 1 for the dates of the censuses and show a considerable average increase in the numbers of wading birds per census during the drying up period in January and a sharp decline in their numbers coinciding with the abrupt rise in water level. The birds showing a decline in numbers are Wood Ibis, White Ibis, American Egret, Snowy Egret, Black-crowned Night Heron, Louisiana Heron, Little Blue Heron, and Green Heron. It seems

equally interesting that the numbers of the Ward's Heron showed no response to these changes.

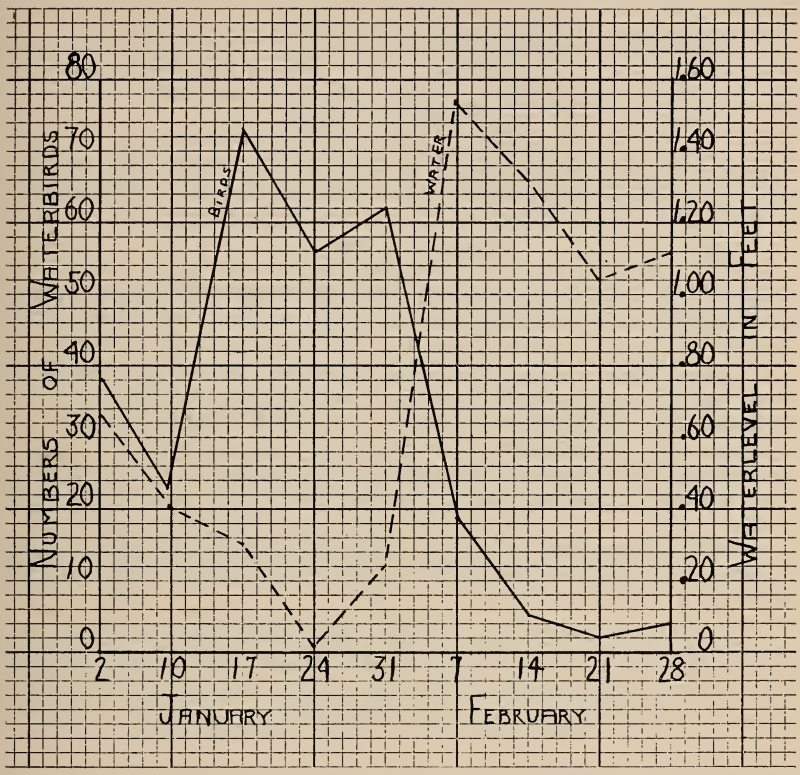

Fig. 1.—The relation of water level changes to the abundance of certain wading birds at Taylor Slough in January and February, 1952. The numbers per census of Wood Ibis, White Ibis, American Egret, Snowy Egret, Black-Crowned Night Heron, Little Blue Heron, Louisiana Heron, and Little Green Heron are totaled to provide the figures used.

The writer is indebted to district ranger Paul Barnes and superintendent Daniel B. Beard whose cooperation and interest made the project possible; to park biologist Joseph C. Moore who offered helpful suggestions during the planning stage and who contributed much to the preparation of the manuscript; and to National Park Service collaborator William B. Robertson and park naturalist Willard E. Dilley for help and encouragement throughout the census.

Where no comparison is made in the following species accounts to Howell's report, it may be assumed that the present writer considers the 1951-52 status of the species to approximate that of 1917-18-19.

Collecting was not attempted, and therefore no subspecific names are used.

Annotated List

Pied-Billed Grebe, *Podilymbus podiceps.* Observed on eleven censuses. Two or three seen each January census, but none February 7 and only one on each remaining February census.

Florida Cormorant, *Phalacrocorax auritus.* Limit of occurrence to December 11 and 26 suggests that it finds the slough more suitable in its high or medium water stages. Not considered common in such small freshwater slough ponds.

Water-Turkey, *Anhinga anhinga.* Present every census. Maximum count was 15 on January 31. Average for 9 January-February counts is 10. Nearly all males in February.

Great White Heron, *Ardea occidentalis.* Observed on 3 censuses in Taylor Slough. Two together January 24. One each February 7 and 28.

Wards Heron, *Ardea herodias.* Present every census, averaging 3 per count in January-February with 5 the highest count on January 10. Numbers consistent in spite of changes in water level.

American Egret, *Casmerodius albus.* Entirely absent from this area during Howell's time, it is now a common winter bird. Found in Taylor Slough in December and January averaging 5 per census. Its absence in February apparently relates to rising water level in glades pools (see fig. 1).

Snowy Egret, *Leucophoyx thula.* Also unknown in this area during Howell's time, this egret is now common in the slough during December and January. On January 24 and 31 there were 13 and 12 recorded. One lone bird February 7, none thereafter.

Louisiana Heron, *Hydranassa tricolor.* It would be of interest to know if this and the next heron's disappearance (Howell *op. cit.* p. 254) after being " . . . numerous . . . January 15-26, 1918 . . . " was related to a rain and rise of water level, and if the presence of this one February 20-28, 1919, correlated with absence of rains. My censuses show an average of 6 per census in January, and 3 on February 7, after which there were none.

Little Blue Heron, *Florida caerulea.* Common in winters of 1917, 18, and 19. My count averaged 2-3 birds through December and January and until February 14, after which none were seen. A count of 20 made in Taylor Slough January 31.

Eastern Green Heron, *Butorides virescens.* Moderately numerous as it was in Howell's period. Average of 6 seen each count with a high of 15 on January 17. Tapered off in February with one bird the 21st, none thereafter.

Black-Crowned Night Heron, *Nycticorax nycticorax.* Records were spotty through December and February. January showed an average of 3 per count. Adults and immatures seemed to be represented equally. They seem to have been more numerous in 1918, and were recorded only as winter birds.

Yellow-Crowned Night Heron, *Nyctanassa violacea.* Only 1 record for the entire winter. An adult roosting in the willows of Taylor Slough on January 31. Howell also found it to be an uncommon winter visitor to the slough.

American Bittern, *Botaurus lentiginosus.* One secretive individual discovered December 11 in the slough. Probably more common than would be indicated by this lone observation. Howell writes of having seen 1 or 2 almost daily January 15 to February 4, 1918.

Wood Ibis, *Mycteria americana.* Observed on 9 evenly distributed censuses. Usually single ones overhead, but 21 were feeding in the slough January 24. These birds also seemed discouraged by the rising water level in early February. Apparently more abundant now than in Howell's day.

White Ibis, *Guara alba.* Commonest in early December apparently finding this locality suitable for feeding and roosting in the medium water stages of early winter.

Roseate Spoonbill, *Ajaja ajaja.* One immature bird flew over Taylor Slough on February 29. The numbers of spoonbills are steadily increasing at their rookeries in Florida Bay and their dispersal from there to the mainland at this time of year is to be expected (R. P. Allen, 1942, p. 39).

Turkey Vulture, *Cathartes aura.* Commonly counted while soaring high over the slough and hammock. 9 per census was the average for the entire area during the winter.

Black Vulture, *Coragyps atratus.* Our census showed this interesting vulture to be locally common. In 1918 it appears to have been uncommon. A high of 25, a low of 7, with an average of 18 for each count.

Sharp-Shinned Hawk, *Accipiter striatus.* Single birds seen December 11, January 31 and February 7 in the slough area.

Insular Red-Shouldered Hawk, *Buteo lineatus.* At least 2 pairs wintered in the vicinity. One to four seen or heard each count.

Short-Tailed Hawk, *Buteo brachyurus.* We were quite fortunate in observing this rare hawk on 6 of the 12 censuses January 10 to February 28.

Both color phases were seen, indicating at least 2 individuals, dark phase 3 times, light phase 2 times, 1 unrecorded color phase. It was not known to occur here in Howell's time.

Marsh Hawk, *Circus cyaneus.* It is interesting that all the individuals seen were in the drab brown female and immature plumage. Occurred on ten censuses, singly on all counts excepting on January 31 and February 21 when pairs were seen.

Osprey, *Pandion haliaetus.* Single individuals over Taylor Slough on 3 censuses.

Duck Hawk, *Falco peregrinus.* One seen flying over the slough January 17.

Sparrow Hawk, *Falco sparverius.* Single records on 7 of the 12 censuses. In the 3 instances when sex was distinguished they were female. Four of the records from the hammocks and three from the slough. Apparently this bird frequents the hammock much more than in Howell's time.

Limkpin, *Aramus guarauna.* This secretive species was seen twice on censuses this winter in the slough. December 11 and January 2 were the dates. While Howell reports 3 present February 20-27, 1919, he apparently did not see them in the winter of 1918.

Sora, *Porzana carolina.* A very tame individual delighted park visitors as they watched it from Anhinga Trail (boardwalk) over the slough. It first appeared January 10 and was recorded on nearly every census thereafter.

Purple Gallinule, *Porphyrula martinica.* Through the winter there were always Purple Gallinules in Taylor Slough. These usually secretive birds appear quite friendly at the boardwalk in the slough. Nine and three were the most and least recorded on censuses.

Florida Gallinule, *Gallinula chloropus.* A regular standby all winter in Taylor Slough. Usual numbers being 5 or 6 per census with a high of 13 on January 17.

American Coot, *Fulica americana.* Along with the gallinules, 3-4 coots were present every census in the slough. They did not appear to be affected by the changes in water level.

Killdeer, *Charadrius vociferus.* The highpitched calls of these excitable shorebirds were heard high overhead on December 11 and 18. Two were seen flying over the area January 2. In 1918 they appear to have been more numerous.

Florida Barred Owl, *Strix varia.* Regularly heard in the hammock all winter. A pair roosted each morning in a particular live oak tree during the first three weeks of February. Recorded, mostly from their voices, on nine censuses.

Ruby-Throated Hummingbird, *Archilochus colubris.* Single males were seen in the hammock on three occasions. December 18, February 7 and 28.

Eastern Belted Kingfisher, *Megaceryle alcyon.* At least three individuals wintered in the area. One, two or three were seen on every census.

Southern Flicker, *Colaptes auratus.* These woodpeckers seem to prefer the pine woods. However, this winter our census shows single birds observed on Paradise Key on three days, and one heard from Taylor Slough on February 14.

Florida Pileated Woodpecker, *Dryocopus pileatus.* Calls of single birds were heard during censuses on February 7 and 28.

Florida Red-Bellied Woodpecker, *Centurus carolinus.* One or two birds seen or heard each count. There are three records from isolated trees in the slough but the "redbelly" is most often seen in the hammock.

Southern Downy Woodpecker, *Dendrocopos pubescens.* One female observed on 5 occasions in the hammock. Seen regularly in the same area each time, December 18 to February 28.

Southern Crested Flycatcher, *Myiarchus crinitus.* Recorded on 8 censuses. Single observations each census day were usual, however four were seen on February 21 in the hammock.

Eastern Phoebe, *Sayornis phoebe.* One or two records appear nearly every census all winter. Commonly seen along the road through Taylor Slough as they darted out from a perch in the willows to capture a flying insect.

Tree Swallow, *Iridoprocne bicolor.* These swift flyers are seen over Taylor Slough and Paradise Key all winter. On three early morning counts an estimated 100 swirled over the slough and 200 were estimated to be over the same area on February 28. It is a fascinating sight to watch a flock of swallows pinwheel over the surface of a glade pool as they take turns drinking.

Semple's Blue Jay, *Cyanocitta cristata.* More often heard than seen. Two per count is average for nine censuses, with a high of seven on January 24.

Florida Crow, *Corvus brachyrhynchos.* Appear to be much less numerous today than in 1918. Generally one or two seen or heard calling in the hammocks. Never more than two at a time.

Eastern House Wren, *Troglodytes aedon.* Just as in 1918, we found this little wren to be rather uncommon with single observations noted for six of the twelve counts.

Florida Wren, *Thryothorus ludovicianus.* The loud, clear tones of this wren's song was heard throughout the winter. Nearly every count included at least one heard. Most of the censuses show the birds occurring in the hammock but several records from the slough indicate its presence there as well. Count average 3 for all twelve censuses.

Eastern Mockingbird, *Mimus polyglottos.* The cheering mocker is an uncommon sight around Paradise Key. One or two individuals were seen

on 8 to 12 mornings, usually in the fig trees bordering the road through the slough.

Catbird, *Dumetella carolinensis.* This secretive bird was most often heard in the tangles of brush lining the hammock road. Eight was the average count per census for the winter.

Blue-Gray Gnatcatcher, *Polioptila caerulea.* Although seen in the willows bordering the slough, this lively sprite seemed to prefer the hammock trees. Five per count was average for the entire winter, with thirteen recorded in the hammock on January 24. By contrast, Howell found it "uncommon" in the winters of 1917-18-19.

Ruby-Crowned Kinglet, *Regulus calendula.* An uncommon winter visitor. Single birds were seen December 18, January 24, February 7 and 28 in the trees of Paradise Key. Howell reported only one record.

Key West Vireo, *Vireo griseus.* A resident species which first made its presence known vocally late in January. Numbers most commonly heard from the willows in the slough as well as in the hammock. Average of 6 per count through February.

Blue-Headed Vireo, *Vireo solitarius.* Lone individuals of this uncommon winter resident were recorded in the hammock on December 18, January 24 and February 28.

Parula Warbler, *Parula americana.* Three of these beautiful warblers first appeared in the hammock on January 24. All records were from the hammock ranging from 2 to 4 per count (4 censuses).

Myrtle Warbler, *Dendroica coronata.* Park Naturalist Dilley considers this energetic warbler to be ordinarily quite common here in the winter. However, this winter I have only 3 records of single birds on December 18 and 26 and January 31.

Yellow-Throated Warbler, *Dendroica dominica.* Paradise Key hammock harbored single males recorded on the following census days. December 11 and 26, January 17 and February 21.

Florida Prairie Warbler, *Dendroica discolor.* This colorful warbler was recorded singly on 3 counts, and three were tallied on January 17. They were usually seen in willows bordering the road through the slough.

Western Palm Warbler, *Dendroica palmarum.* Whereas this warbler occurred, " . . . in the open parts of the hammock and along roadsides in the pineland" according to Howell *(op. cit.,* p. 262), my censuses show a frequency of occurrence of 10 for the slough to 5 for the hammock with a prominent lumping of frequency and abundance in the hammock in February. The winter average was 5 with a high of 10 reached on February 14 and 21.

Eastern Ovenbird, *Seiurus aurocapillus.* The hammock was home this winter for at least 2 of these unobtrusive warblers. At least one was seen on 6 of the twelve counts.

Florida Yellow-Throat, *Geothlypis trichas.* By far the most common glades warbler. My records indicate that both males and remales were abundant in Taylor Slough. They were also present but less numerous in the hammock. The average for the 12 counts was 11 per day.

Southern Meadowlark, *Sturnella magna.* One or two were the usual numbers on 8 censuses from Taylor Slough.

Maynard's Red-Wing, *Agelaius phoeniceus.* Small groups of 2 or 3 wintered in the slough. All appeared to be males. The first larger flocks appeared on February 14, at which time there were 12 males and 3 females. The next week a flock containing 17 males and 5 females was counted and on February 28, 10 males and 5 females. Absence of females during the early part of the winter may be unusual here since Howell did not report it.

Boat-Tailed Grackle, *Cassidix mexicanus.* These large, noisy blackbirds were quite numerous on the slough all winter. Counts (10 censuses) show an average of 4.

Florida Grackle, *Quiscalus quiscula.* Although this bird was also seen on 10 of the 12 counts, it was not as numerous as the boat-tails. Average per count was 2, and habitat was the slough.

Florida Cardinal, *Richmondena cardinalis.* A common resident in the hammock area and occasional on the slough. Seen or heard on ten counts, averaged 5 per census.

Eastern Goldfinch, *Spinus tristis.* Drab-plumaged goldfinches were observed in small flocks over the slough and hammock on December 11, 18, and January 17.

Swamp Sparrow, *Melospiza georgiana.* One recorded in Taylor Slough on December 26 and 3 on February 7.

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